HIGH FIDELITY NURSING SIMULATION: IMPACT ON STUDENT SELF-CONFIDENCE, CRITICAL THINKING, AND CLINICAL COMPETENCE

A RESEARCH PAPER

SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE

MASTERS OF SCIENCE IN NURSING

BY

JULIA L. CLARK

DR. BETH KELSEY - ADVISOR

BALL STATE UNIVERSITY

MUNCIE, IN

JULY 2012

TABLE OF CONTENTS

Chapter I

Introduction

Introduction

Nurse educators are interested in expanding teaching-learning methods to assist nursing students to develop safe nursing practice. Nursing education is ever changing as it attempts to keep up with technological advances. One example of the technological advances is the use of high-fidelity simulation (HFS). HFS is a teaching strategy that allows students to apply theory in a safe controlled environment that mimics a health care facility. Students are able to role play common patient situations in the laboratory before being exposed to them in the clinical setting. Fidelity is a term used to describe the realness of the simulation experience. Simulation can present as low, moderate or high fidelity simulation. A HFS is one that provides an experience that closely mimics the real life situation (Kameg, Clochesy, Mitchell, & Suresky, 2010). HFS allows for the development of students cognitive, affective and psychomotor skills in a realistic replication of a health care setting (Wotton, Davis, Button, & Kelton, 2010). For this research project, the focus will be on high-fidelity simulations and the effects the simulation has on student outcomes.

Background and Significance

Simulation has long been used in aviation, transportation, space exploration and nuclear power industries (McNeal, 2010). Anatomical models served as the basis for beginning simulations in nursing education. "Resusci-Anne" was the first simulator developed by Laerdal for cardiopulmonary training (Bradley, 2006). Since the early beginnings of simulation, technological advances have increased the fidelity or realness of the simulation exercises. Nursing education programs now utilize low, moderate and high-fidelity simulations.

Problem Statement

The problem faced by healthcare workers today is a patient population needing increasingly complex care. The complex care is a result of high health care costs with individual's not seeking care until very ill and shorter hospitalization stays. The increasing patient complexity requires new graduate nurses to be better prepared for the demands of the health care setting. Nursing educators are faced with the task of teaching students critical thinking skills that improve their clinical judgment and improve their self-confidence. HFS provides educators with the ability to help students to learn the skills of communication, delegation, prioritization, and time management.

Purpose Statement

The purpose of this study is to determine if HFS is an effective active learning strategy to enhance undergraduate nursing students' self-confidence/efficacy, critical thinking/clinical judgment and clinical competence. This study is a replication of the study completed by Blum, Borglund and Parcells (2010).

Research Question

When using HFS, how do student ratings of self-confidence and competence correlate with students who do not participate in a HFS?

Theoretical Framework

The theoretical framework for this study is Tanner's (2006) Clinical Judgment Model. Tanner developed this model based upon review of almost 200 research studies. The Clinical Judgment Model helps to explain why HFS is an effective teaching strategy for teaching critical thinking, clinical judgment and improving competence. Critical thinking is an acquired skill utilized by nurses in a problem-solving capacity. The model integrates the concepts of noticing, interpreting, responding, and reflecting which can be correlated with nursing process. Noticing is affected by the nurse's knowledge or background information on the patient along with the nurse's perception of excellence, values, culture and work environment of the facility. Interpreting is the phase that takes the information known, analyzes and determines a plan of action. Reflection can be divided into reflection-in-action and reflection-on-action. Reflection-in-action is based upon the nurse's skill to determine how effective the nursing interventions are for the patient. Reflection-on-action demonstrates how nurses continue to develop increase their critical thinking ability. This is ongoing and completes the process (Tanner). The Clinical Judgment Model provides the foundation for exploring how HFS helps nursing students to develop self-confidence and competence.

Definition of Terms

Conceptual.

The following are terms from the study that researchers need to define conceptually or by general notions. Self-confidence can be defined as "the belief in one's self and in ones powers and abilities" (Merriam-Webster Online, 2012). Self-confidence is a concept that has interrelated concepts including self-concept, self-esteem, and self-certainty. Additionally, three attributes have been identified. The first attribute is the belief that one can attain a positive outcome. The second attribute is persistence as evidenced by resilience to overcome obstacles. The third attribute is self-awareness in an effort to reduce stress and anxiety (White, 2009). Clinical competence goes along with self-confidence, in that clinical competence is simply self-confidence regarding clinical skills, knowledge and care.

Operational.

Self-confidence and clinical competence will be measured using selected items from the Lasater's Clinical Judgment Rubric (LCJR) (Lasater, 2007). During midterm and finals week, students and the instructors will complete the LCJR. The LCJR consists of four subscales, noticing, interpreting, reflecting and responding. The LCJR is based upon Tanner's (2006) Clinical Judgment Model.

Limitations

The sample size that will be used in this study is relatively small. Using a larger sample size could be valuable in determining the efficacy of HFS in promoting self-confidence and competence in nursing students. The study may require more than one semester for review due to the complex nature of the concepts being explored.

Assumptions

Critical thinking, self-confidence and competence are skills needed to be an effective and prudent nurse. In order to educate nursing students in these skill areas, nurse educators have a responsibility to utilize teaching strategies that enhance the development of self-confidence and competence.

Summary

This chapter has discussed the problem, purpose, theoretical framework, definition of terms, limitations, and assumptions of the development of critical thinking skills as evidenced by self-confidence and competence through the use of HFS. A background on the significance of HFS reveals that this topic may be an effective teaching strategy that promotes the development of critical thinking. A study conducted on HFS could be beneficial for both nurse educators and nursing students if the study reveals that HFS enhances the development of critical thinking as evidenced by clinical competence and self-competence in the clinical setting

Chapter II

Review of Literature

Introduction

HFS is a teaching strategy utilized by many nurse educators to encourage the development of critical thinking skills. This chapter is a literature review of research studies on the use of HFS and is organized into three sections: HFS effects on self-confidence/efficacy, HFS effects on critical thinking/clinical judgment and HFS effects on competence. The review contains three articles on self-confidence/efficacy, three articles on critical thinking/clinical judgment and four articles on competence.

Theoretical Framework

The theoretical framework for the study is Tanner's (2006) Clinical Judgment Model. According to Tanner, the terms clinical judgment, problem solving, decision making and critical thinking are all used interchangeably. Clinical reasoning is the term used by Tanner that

> Refers to the processes by which nurses and other clinicians make their judgments, and includes both the deliberate process of generating alternatives, weighing them against the evidence and choosing the most appropriate, and those patterns that might be characterized as engaged, practical reasoning (Tanner, 2006, pp. 204-205).

Tanner developed the Clinical Judgment Model after completing a literature review of over 200 relevant articles. Tanner's model includes the four aspects of noticing, interpreting, responding and reflecting (2006).

The first phase or aspect of the model is noticing. This phase involves understanding data that the nurse is already aware of such as the patient history and then gathering additional information of the current situation. The nurse establishes expectations for the patient and the nurse will determine if those expectations are met. Factors that can affect how the nurse notices changes is the nurse's view of excellent care, values related to the present situation, culture in the care facility and history of patterns of care related to similar situations of complex care (Tanner, 2006).

The second phase of the Clinical Judgment Model is interpreting. This requires the nurse to survey the known information to develop a thorough understanding of the situation in order to determine how to clinically respond. The nurse forms hypotheses using deductive reasoning and tests each hypothesis through careful assessment until the most likely response has been determined (Tanner, 2006). The nurse can then begin to intervene or respond to the patient's needs.

The third phase is responding. The nurse analyzes the patient's situation and responds with nursing actions or non-actions. The nurse continues to evaluate the patient outcomes and adjust care based on those outcomes. This phase is similar to the intervention phase of the nursing process (Tanner, 2006).

The final phase of the Clinical Judgment Model is reflection. The nurse reviews the previous responses and determines how appropriate each response was for the situation. This phase is divided into two components of the model, the reflection-on-

action and the reflection-in-action. Reflection-in-action examines how the patient responds to the nursing interventions. The nurse then adjusts interventions based on the patient's response. Reflection-on action is the final phase of the model. This is the analysis of the experience and what the nurse gains from the occurrence (Tanner, 2006). Reflection requires an introspective view of the nurses' personal actions as well as a retrospective view of the overall patient situation from the starting introduction to the completion of the patient outcome.

The Clinical Judgment Model provides a pathway for nurses to engage in complex, critical patient situations that require clinical judgment through critical thinking skills. Nurses must learn to determine when their actions are meeting or not meeting the needs of the patient and devise a plan to reevaluate an alternative route to achieve positive patient outcomes. Nurse educators utilize this model in HFS. The debriefing or reflection allows the student nurse to recall and recognize the factors that contributed to a positive or negative patient outcome. Through research, there is a body of evidence that supports reflection contributes to improving critical thinking or clinical reasoning (Tanner, 2006). The following HFS research articles have been summarized in an effort to demonstrate the effectiveness of HFS on self-confidence/efficacy, critical thinking/clinical judgment and on overall competence.

Self Confidence/Efficacy

Research supports the use of high fidelity simulation (HFS) as a teaching strategy in nursing education. Studies, however, have been limited in looking at the specific factors that lead to the positive learning outcomes using HFS. Studies in this area have generally had small sample sizes and have not used instruments with established

psychometric properties. The following studies focused on the development of self-confidence or self-efficacy following HFS.

Smith and Roehrs (2009) used Jeffries Nursing Education Simulation Framework (Jeffries, 2007) in a study of factors impacting the outcomes of using HFS in a nursing education setting. The purpose of the study was to measure two outcomes of the Nursing Education Simulation Framework: learner satisfaction and self-confidence. The study also examined the correlation of two components of the framework, student demographic characteristics and simulation design characteristics. There were five research questions. The first question asked how satisfied baccalaureate nursing students are with HFS scenario experience. The second question asked about the self-reported effect of HFS scenario experience on baccalaureate nursing student's self-confidence. The third question examined how baccalaureate nursing students evaluate a HFS scenario experience with regards to the five simulation design characteristics of the Nursing Education Simulation Framework. The fourth question looked at the correlation between the perceived presence of design characteristics and reports of self-confidence and satisfaction of baccalaureate nursing students who participated in a HFS scenario. The final research question examined the correlation between the demographic characteristics of baccalaureate nursing students and reports of self-confidence and satisfaction after a HFS scenario.

The study took place in the western United States at a public school of nursing. The school offered programs ranging from a traditional Bachelor of Science in Nursing to doctoral program. The sample included 68 nursing students in their junior year who were enrolled in their first medical-surgical course. Most of the participants were female (90%)

with an average age of 23.4 (*SD*=5.4). Greater than two-thirds (69%) of participants had no prior experience working in a health care setting other than nursing school. Close to half (47%) of the students in the sample had no previous experience working with HFS (Smith & Roehrs, 2009).

The course offered a 56 hour didactic skills lab that taught a variety of skills for the first seven weeks of the course. Students were scheduled to complete the simulation on weeks nine or ten of the course. Students were assigned to participate in groups of four. Two of the students were asked to complete a physical assessment and administer medication to a patient with chronic obstructive pulmonary disease (COPD). The other two students were assigned to record observations. The scenario lasted until students intervened to help the patient or 20 minutes, whichever came first. Following the scenario and debriefing, students were asked to complete the research instrument. The researchers developed the demographic instrument. Two instruments developed for the National League for Nursing by Jeffries and Rizzola (2006) were used: Student Satisfaction and Self-Confidence in Learning Scale and the Simulation Design Scale (SDS). Validity for both instruments was determined by a review of 10 experts in medical-surgical nursing. Both scales use a 5-point Likert scale. The Student Satisfaction and Self-Confidence in Learning Scale consisted of 13 items and reported Cronbach's alphas of 0.94 for the satisfaction subscale. The SDS with five subscales reported Cronbach's alpha of 0.92 (Smith & Roehrs, 2009).

The results of the data analysis for each research question were as follows. Research question one: Scores for the satisfaction subscale of the Student Satisfaction and Self-Confidence in Learning Scale ranged from two to five with an overall mean

score of 4.5 (*SD*=0.5). Results indicated students were satisfied with the teaching method. Research question two: Scores for the Self-confidence subscale ranged from one (strongly disagree) to five (strongly agree). The overall mean score of 4.2 (*SD*=0.4). The students felt confident in their ability to care for a respiratory patient following the HFS. The self-confidence analysis was based on a student's experience with caring for a patient with a respiratory condition. The mean score for students with experience was 4.2 (*SD*= 0.5). The mean score for students without experience was 4.3 (*SD*=0.4) which was not significantly different. Research question three: The SDS score ranged from two to five. These responses indicated that the students felt positively about the five design characteristics. The highest rated design characteristic was Guided Reflection (*M=4.8; SD*=0.4). The lowest rated design characteristic was Objectives, (*M*=4.4, *SD*=0.5). Research question four: The design subscale with the highest correlation to both student satisfaction (*r*s=0.614) and self-confidence (*rs*=0.573) was Objectives. This indicated a moderate correlation between the design characteristic of Objectives and the outcomes of satisfaction and self-confidence. All other correlations were weak to moderately weak. The fifth and final research question used a Spearman's rho. No significant correlations were found to exist between any of the five demographic characteristics: age, gender, previous degree, health care experience and simulation experience and students' reports of satisfaction or self-confidence (Smith & Roehrs, 2009).

Smith and Roehrs (2009) concluded that nurse educators must carefully consider the design of HFS. It was suggested that a template might be useful to ensure that all five design characteristics from the SDS are present. The researchers recognized that faculty workloads are such that additional responsibilities to accomplish this attention to design

might be difficult. However, results of this study may allow for open discussion to include time for HFS preparation time as student satisfaction and self-confidence are correlated with design characteristics.

Nurse educators are interested in expanding teaching-learning methods to help entry-level nursing students develop safe nursing practice. High fidelity simulation is one method that nurse educators are currently using for this purpose. More research would be valuable in discerning if changes occur in self-confidence and competence of entry-level nursing students with the use of high fidelity simulation.

Nurse educators are continuing to utilize clinical simulation with high fidelity mannequins in nursing education. Clinical simulation allows students to apply theoretical principles of nursing care in a safe and controlled learning environment. More research is needed to determine the impact of clinical simulation on the self-efficacy of nursing students.

The purpose of this study by Bambini, Washburn, and Perkins (2009) was to examine simulated clinical experiences as a teaching-learning method to increase the self-efficacy of nursing students during their initial clinical course of a four-year baccalaureate program. There were three research questions. The first question asked if simulated experiences increase the self-efficacy of students preparing to enter the obstetric clinical setting. The second research question asked the perceptions of students regarding the simulated clinical experience. The third research question asked how a student's previous experience working with patients correlated with perceived level of confidence in clinical skills. The framework for the study was Bandura's Social Cognitive Theory (Bandura, 2004).

This study took place in the Midwest region of the United States in a baccalaureate program with students in their first semester of clinical experience. The study took place over four semesters. The sample included 112 students. The mean age of participants was 24.85 years (*SD*=6.7). A majority of 57% had previous experience in the health care field. Additionally, 26% had previously completed a baccalaureate degree prior to beginning the nursing program (Bambini, et al., 2009).

Bambini, et al, (2009) developed three surveys, a pretest, a posttest and a follow-up survey. Each survey consisted of six questions using a ten point scale from one (not at all confident) to ten (very confident). The posttest and follow up survey also contained three open ended questions. The three developed surveys were numbered and placed in a blank envelope so that results for all three surveys completed by the same student could be reviewed together. All students were enrolled in a three hour postpartum simulation lab. The lab had eight stations with various types of simulated and programmed situations. Students prepared for the lab by doing assigned readings and watching assigned video demonstrations. The researchers used the constant comparison method (Glaser and Strauss, 1967), to identify conceptual themes in the three open ended questions. Concepts were then categorized according to Lenburg's eight core practice competencies (Lenburg, 1999).

The results of the data analysis for the study were as follows. Internal consistency was determined to be acceptable (*Cronbach's alpha: pretest*, 0.817; *posttes*t, 0.858). A *t*-test analysis was used to compare the means of the pretest and posttest scores. Students experienced an overall significant increase in self-efficacy ($p < .01$), A pairwise comparison revealed a significant increase in student confidence in performing a

postpartum exam after the simulation experience (p <0.01). Students experienced an increase in confidence in assessing vital signs (p <.01), breasts (p <.01), fundus (p<.001), and lochia (p<.001). Qualitative data found the students felt the simulation was a valuable learning experience and their self-confidence increased by knowing what to expect. The greatest increase in self-confidence was in assessing the fundus. Three conceptual themes were identified by Bambini, et al. (2009) in the three open ended questions: communication, confidence and clinical judgment.

Bambini, et al. (2009) concluded that clinical simulation experiences can be effective in increasing student's self-efficacy in performing clinical skills. The researchers noted that simulation may provide the bridge between theory and clinical practice by providing a safe learning environment.

Research often examines more than one effect of HFS. In HFS studies, critical thinking, self-confidence and competency are often intertwined. In a study by Blum et al. (2010), the purpose was to examine the relationship between the use of high fidelity simulation, student self-confidence, and clinical competence in entry level nursing students. There were two research questions. The first question asked how student ratings of self-confidence and faculty ratings of student competence correlate between midterm and final assessment. The second research question asked how enrollment in a traditional or simulation-enhanced laboratory course impact student self-confidence and clinical competence. The framework for the study was Tanner's Clinical Judgment Model (Tanner, 2006).

This study took place in southeastern university in the United States. The sample included 53 entry-level Bachelor of Science Nursing students in their junior year. The

majority of the final sample consisted of Caucasian (*n*=36, 67.9%) females (*n*=47, 88.7%) with a mean age of 30 years (*SD*=9.63). Thirty students (56.6%) had no prior healthcare experience and thirty-five students (66%) were not employed during the data collection (Blum, et al., 2010).

Lasater's Clinical Judgment Rubric (LCJR) (Lasater, 2007) was used for data collection in the study. All students were enrolled in the same 13 week course. Students were enrolled in one of three laboratory sections. Each section met weekly for seven hours of instruction. The control group (*n*=16 students) demonstrated skill competency using the traditional approach with task trainers and volunteers. The experimental group (*n*= 37) demonstrated competency using Laerdal's SimMan. During the midterm and final week of their clinical practice course, students and faculty completed the LCJR. The LCJR included the four subscales of noticing, interpreting, reflecting and responding. Blum, et al. (2010) selected items from the rubric measured self-confidence and clinical competence. Self-confidence was measured with four items, calm/confident manner, well-planned interventions/flexibility, evaluation/self-analysis, and commitment to improvement. Clinical competence was measured using four items, recognizing the deviations from expected outcomes, information seeking, prioritizing data, and clear communication.

The results of the data analysis for the study were as follows. Student midterm and final self-confidence ratings correlated positively (*r*=4.83, *p*=.001) and were significantly different (*t*=5.100, *df*=52, p=.001). Twenty-seven students rated their self-confidence in the exemplary range at final assessment compared to only 16 rating exemplary at midterm. Analysis of data from the faculty evaluation of clinical

competence using the LCJR found a positive correlation from midterm to final evaluations (r=.386, p=.004) which was significantly different (t=7.236, df=52, p=.000). Competence for both groups showed 38 students held an exemplary rating at the final as compared to only 16 at the midterm. Student self-confidence and competence increased regardless of traditional or simulation laboratory enrollment.

Blum, et al. (2010) concluded that the use of traditional lab methods such as task trainers and return demonstration was as effective as simulation enhanced lab methods for entry-level nursing students. Entry-level students' self-confidence and competence increased regardless of whether a traditional lab or a simulation lab was used.

Research has demonstrated a positive correlation between clinical simulation and self-efficacy. Nurse educators are interested in teaching-learning methods that develop self-efficacy and lead to competent care. High fidelity simulation is becoming increasingly popular in pre-registration nursing programs in the United Kingdom. Pre-registration programs are required for a nursing student in the United Kingdom in order to meet criteria for registration with Nursing Midwifery Council.

Pike and O'Donnell (2010) used Bandura's (1986) Social Cognitive Theory in a qualitative study exploring the impact of clinical simulation on self-efficacy beliefs among pre-registration nurses. The purpose of the study was to examine the impact of clinical simulation on pre-registration nurses' self-efficacy beliefs.

The study took place in the United Kingdom. The sample was recruited from previous research participation in a preliminary study by Pike (2008). Nine students participated in a focus group interview. The focus group questions were developed using common themes in the preliminary study results. Themes included: the importance

of enactive mastery experiences for self-efficacy beliefs, the value of vicarious experiences, the influence of the educator/mentor, and teaching and learning methods within clinical simulation. Data were collected by asking an opening question and then focusing the sample group on the identified themes. The participants were able to share their thoughts freely. The focus group met for 48 minutes and the discussion was recorded by a Dictaphone and then transcribed. One researcher transcribed the data. Pike and O'Donnell (2010) each reviewed the transcripts independently and then met to discuss findings on several occasions. Common themes were identified and then grouped together.

Two themes emerged from the data: learner self-efficacy in relation to communication skills and the need for authenticity when performing simulations. Participants expressed low self-efficacy with regards to communication skills and felt the simulations were more concerned with psychomotor skills. Communication is a key component in providing nursing care and researchers noted it should be incorporated into nursing education. The second theme, authenticity of the simulation, was noted by participants as being challenging to view the simulator in the same way one would view a patient. The researchers found that the fidelity or realness of a simulation was necessary for the participant to fully engage (Pike & O' Donnell, 2010). .

Pike and O'Donnell (2010) concluded that self-efficacy was not enhanced by simulation. In order for the simulation occurrence to be a positive learning experience, the simulation must match the real environment as closely as possible. Simulations are designed and implemented in varying ways. Further research is needed to determine the relationship between simulation and self-efficacy. The researchers recognized that the

small sample size and the lack of randomization limited the acceptance of the findings. Further research is also needed to determine the relationship between self-efficacy and clinical competence.

Critical Thinking/Clinical Judgment

Nurse educators are interested in offering teaching-learning methods that develop critical thinking skills. High-fidelity simulation is one method that nurse educators are currently using for this purpose. More research would be valuable in determining if changes occur in critical thinking skills and affect a student's overall self-confidence and competence.

The purpose of the study by Sullivan-Mann, Perron and Fellner (2009) was to determine if critical thinking was improved in the associate degree nursing student after being exposed to multiple clinical simulation scenarios. The hypothesis for the study was that the experimental group exposed to more clinical simulation scenarios would achieve a higher score on the Health Sciences Reasoning Test (HSRT) (Facione & Facione, 2006). The framework for the study was the Roy Adaptation Model (Roy & Andrews, 1999). This study took place in a Midwestern city in the United States. The sample included 53 Associate Degree nursing students enrolled in the Nursing II course. The majority of the sample consisted of females (*n=50*, 94.3%), aged 20-42, with a mean age of 26.5 years (*SD*=5.9). All participants were enrolled in the fall semester of 2007 (Sullivan-Mann, et al.).

Critical thinking was measured using the HRST focusing on the areas of interpretation, analysis, evaluation, explanation, and inference (Facione & Facione, 2006). All students were enrolled in the same 16 week semester. Students were divided

among seven clinical groups with seven to eight students in each group. All students took the HRST pretest and then were randomly assigned to the experimental or control group. The experimental and control groups both followed the curriculum schedule of two simulation scenarios during weeks 1 and 15 of the semester. The experimental group received three additional scenarios during weeks 7, 11, and 13. The high-fidelity simulator used was Model ECS from Medical Education Technologies, Inc. (METI). Students had initial exposure to the simulator in a previous course in spring 2007 (Sullivan-Mann, et al., 2009).

The results of the data analysis for this study were as follows. A two group times two time (pretest & posttest) mixed model design was used. A *t*-test was conducted on mean total scores at pretest and there was not a significant difference between the experimental and the control group ($p>.05$). There was a significant main effect for time (F 1,510=8.78, $P<.01$), indicating more correct answers were made on the posttest by both groups. There was not a significant difference between the groups overall (F 1,510=1.43, $P<.05$). The two groups were tested individually on the total HRST score at pretest and posttest. The experimental group answered significantly more questions correctly than they did at pretest (F 1,260=6.74, $P<0.5$). The control group did improve but did not answer significantly more questions correctly on the posttest. For the experimental group, significant main effects were found for deductive reasoning (F 1, 51.0=9.96, $P<.01$) and analysis (F 1, 51.0=9.86, $P<.01$), indicating both groups did significantly better in these areas on the posttests (Sullivan-Mann, et al., 2009).

High-fidelity simulation has become a common teaching strategy in many nursing schools; however research has been limited on the best way to implement and evaluate

simulations. Dillard, Sideras, Ryan, Carlton, Lasater, and Siktberg (2009) used Tanner's (2006) Clinical Judgment Model in a study to examine the effectiveness of a faculty development workshop focusing on evaluating student critical thinking following a high fidelity simulation (HFS). Additionally the researchers evaluated student learning and the perceptions of faculty and students on clinical practice following HFS.

The study took place in a school of nursing in the Midwest United States at a public university. Faculty from two schools of nursing collaborated on the research project. Quantitative and qualitative data were collected from faculty and student evaluations and students' reflective statements or journals. The sample included 68 junior level students who were enrolled in an adult health course and participated in the simulation exercise, while only 25 participants completed the final phase of the study (Dillard et al., 2009). A faculty development workshop was conducted one week prior to the HFS. Researchers utilized the Cervero (1985) Model as the framework for the faculty evaluation of the project. Two faculty members with expertise in the use of Tanner's (2006) Model of Clinical Judgment and Lasater's (2007) Clinical Judgment Rubric facilitated the workshop. Faculty members were given an opportunity to practice applying the rubric by watching an audiovisual recording of a HFS. The week following the workshop, the students and faculty participated in a HFS. Each student was given report on a patient with heart failure (HF). The goal of the HFS was for students to notice, interpret and respond to respiratory distress. The simulation and debriefing lasted approximately 15 minutes and was recorded. Following completion of the HFS, each student completed a self-assessment. Then students who participated in the study were

assigned to care for a cardiovascular patient in the clinical setting. Students completed guided written reflections following the care (Dillard et al., 2009).

Findings related to the project objectives were as follows. The first outcome focused on the response to the faculty development workshop. Modifying a questionnaire from a former research project, the researchers developed a questionnaire to measure the effectiveness of the current project. A 40 item questionnaire was used with a 5-point Likert scale (1=strongly disagree and 5= strongly agree). Reliability was reported as r=.94. Six subscales were used: organizational environment, motivation of faculty, educational program in relation to change, educational offering in relation to clinical judgment, instructor presentation and faculty self-evaluation about Tanner's (2006) Clinical Judgment Model and Lasater's (2007) Clinical Judgment Rubric. Faculty self-evaluations (N= 16) of the workshop were examined using the following subscales: organizational environment, 8 items, M= 4.3; Motivation of faculty, 8 items, M= 4.7; Educational Program and Change, 8 items, M= 3.9; Educational Program, 5 items, M= 4.3; and Instructor Performance, 7 items, M= 4.5. Additionally faculty were asked to rate their skill acquisition in relation to competence on a novice-to-expert scale (1=novice, 5=expert). Faculty rated themselves as competent (3.0). Researchers determined the workshop to be beneficial with faculty gaining skill and understanding of HFS (Dillard et al., 2009).

The second project was to evaluate student outcomes after one HFS. Six learning objectives were identified for the HFS. Students completed a self-assessment using the following scale: 1=did not get it at all, 4=totally got it. The learning objectives were: (a) recognize how body position affects work of breathing (M= 3.81, SD 0.5), (b) note the

value of fluid volume assessment (*M*=3.63, *SD* 0.64), (c) respond to patient anxiety (*M*= 3.72, *SD* 0.600, (d) describe the importance of adherence to drug treatment plans (M= 3.51, *SD* 0.72), (e) know how lab values can be used (*M*= 3.12, *SD* 0.82), and (f) respond with a level of communication necessary to teach (*M*= 3.51, *SD* 0.68). Students rated their knowledge lowest on the objective, know how lab values can be used (Dillard et al., 2009).

The final project was to explore the perceptions of students and faculty regarding the impact of HFS on actual clinical practice. Student journals were reviewed to determine their level of clinical judgment ability. The following is a sample of the review of student reflections.

> Student is able to recognize deviations from normal findings. Student statements missed key assessment findings as well as patient's breathing patterns, vital signs, mental status and renal function. The student chose to educate the patient on diabetes foot care instead of education related to HF. Student's presented at the beginner level of noticing, disorganized assessment, and missing important assessment findings (Dillard et al., 2009, p. 102).

Dillard et al. (2009) concluded nurse educators do not have a standardized curriculum for HFS or a standardized method for evaluating its effects. Faculty development provided on Tanner's Clinical Judgment and the Lasater Rubric was effective. The researchers recognized that further development of HFS is necessary. However, results of this study shed light on the importance of faculty development prior to implementation of HFS as a framework for the simulation.

Research supports the use of high-fidelity simulation (HFS) as a teaching strategy in nursing education. Lewis and Ciak (2011) used Jeffries (2007) Nursing Education Simulation Framework in a study of factors impacting the outcomes of using HFS in a nursing education setting. The purpose of the study was to examine the influence simulation laboratory experiences have on critical thinking, student satisfaction, self-confidence and cognitive learning. The study used a quasi-experimental design to conduct the investigation. The study took place in Eastern United States at a private school of nursing. The sample included 63 senior students enrolled in the Growing Family Nursing course between September 2006 and December 2007. The participants were primarily Caucasian women with an average age of 28. No additional student information was provided. The course offered eight HFS scenarios focusing on pediatric and maternal-newborn scenarios. Prior to the simulation day, students were provided access to a Power point

that provided the theoretical content on which the scenarios were developed. Students arriving to the lab were asked to complete an online 20 question multiple choice pretest. Students then completed four pediatric simulations and four maternal-newborn simulations. Following the scenarios, students completed a post-test, which was identical to the pre-test in format and questions. One to two weeks after the scenarios during the final semester evaluations, participants completed the National League for Nursing Student Satisfaction and Self-Confidence in Learning Tool developed by Jeffries and Rizzola (2008). The scale uses a 5-point Likert scale. The Student Satisfaction and Self-Confidence in Learning Scale consisted of 13 items and reported Cronbach's alphas of 0.94 for satisfaction and 0.87 for self-confidence (Lewis & Ciak, 2011).

The results of the data analysis were as follows. All 63 students completed the pre-test with a mean score of 0.664 and a 95 percent confidence interval. Sixty-two students completed the post-test with a mean test score was 0.823 and a 95 percent confidence interval. For all four semesters studied, a significant increase in knowledge was noted using a paired student *t*-test ($p < 0.005$). There were positive results for satisfaction and self-confidence as well. The overall mean score for satisfaction was 4.33 and the overall self-confidence score was 4.35 (Lewis & Ciak, 2011).

Lewis and Ciak (2011) concluded students respond positively to HFS through the cognitive and affective domains. The researchers were unable to determine critical thinking conclusions based on study findings. Further research is needed to determine how critical thinking relates to HFS. However, results of this study may promote discussion on ways to better evaluate the effects of HFS on critical thinking skills.

Studies have been limited in examining the efficacy of complex HFS versus simple simulations. In a study by Guhde (2011), the research question asked was if students perceive the effect of critical thinking, assessment, and satisfaction with teaching to be better with complex versus simple patient simulation scenarios.

Guhde (2011) conducted a study using Jeffries (2005) Nursing Education Simulation framework. The researcher utilized critical thinking, learning (awareness of the importance of assessment), and learner satisfaction as outcome measures. The study took place at a school of nursing in Ohio. The sample included baccalaureate junior nursing students in the medical-surgical clinical rotation (N=134). Students were required to participate in four hours of simulation for the course. Two hours were used for four simple vignettes and two hours were used for two complex scenarios using HFS.

The first four weeks of the term, participants were presented with simple vignettes, each week involving one event. The vignettes did not use the high-fidelity simulators to their full potential. Instead, the simulator was limited to vital signs and lung sounds. The simple simulations included a fluid overload problem, blood transfusion reaction, aspiration and an evisceration. The last two weeks the students participated in two complex high fidelity simulations involving a bariatric and a drug overdose patient. Four to five students completing a focused assessment on the manikin were used for the simple vignettes. At the completion of the assessment, students were to write out the answers to the following questions: what should you do first, what problems do you identify, and what nursing actions would be appropriate? In the complex scenario student's role played as the primary nurse, second nurse, nurse aide family member or respiratory therapist. The first scenario involved a gastric bypass patient who became hypovolemic with an asthma attack. The second scenario involved a hip fracture patient that overdosed with the patient controlled analgesia (PCA) due to renal failure.

Following the completion of all the simple vignettes and after each complex scenario, participants were given a three statement survey using a 5-point Likert scale (5=strongly agree and 1= strongly disagree). The three statements were: (a) the assignment used critical thinking skills to analyze a patient's condition (variable: thinking), (b) the assignment enhanced my awareness of the importance of assessment of a patient (variable: assessment), and (c) the assignment was a good learning exercise and should be kept in this course (variable: learner satisfaction). Students completed the survey three times anonymously. Additionally, participants were asked to respond to the following qualitative question, what were the most useful or meaningful things you

learned from this scenario? The simple vignettes were scored together. The following mean scores were noted by the researcher: thinking 4.63 (*SD*=0.57), assessment 4.69 (*SD*=0.57), and satisfaction 4.68 (*SD*=0.57). Because these were evaluated as a group, a contrast test (*K* matrix) was used to compare the means of the simple vignettes against the complex HFS. No significant difference was found ($p > 0.05$) for the three variables and the total score. The mean scores related to the complex bariatric patient HFS had the following means: thinking 4.73 (*SD*=0.54), assessment 4.78 (*SD*=0.44), and satisfaction 4.78 (*SD*=0.50). The mean scores of the complex overdose HFS were: thinking 4.71 (*SD*=0.49), assessment 4.78 (*SD*=0.43), and satisfaction 4.75 (*SD*=0.53). The complex scenarios were slightly higher than the simple vignettes and were compared using Univariate Analysis. No significant difference was found ($p > 0.05$). The qualitative comments regarding the useful or meaningful part of the scenario were reviewed by the researcher for themes and were categorized as "the roles of the nurse" .The simple vignettes identified the following roles of the nurse: calling physician and focused assessments. The complex scenarios identified delegation, communication, family education and interrelationship of problems. The responses were supportive for the use of both HFS complex scenarios and simple vignettes as a teaching strategy (Guhde, 2011).

Guhde (2011) concluded there was not a significant difference for the three variables and overall score when using simple or complex scenarios. Findings of this study are congruent with previous literature findings. Further research is needed to determine if different levels of simulation are needed for different levels of learners.

Additionally further research is needed to measure cognitive or behavioral changes of students who participate in complex and simple scenarios.

A study by Gates, Parr and Hughen (2012) examined the significance of HFS on nursing students' achievement of knowledge noted by performance on examinations. Little research has been completed in the didactic area of review. Gates et al (2012) hypothesized that students who participated in simulation activities would score higher on course content examinations than those students who did not participate in simulation. The study took at a school of nursing in California. The study sample included 104 baccalaureate students enrolled in their second semester medical-surgical course. The majority (97%) of the participants was female and the mean age was 22.34 years. Students were required to participate in two days of simulation for the course. Preparation for the simulations was consistent with preparation for a clinical experience. Students were expected to demonstrate knowledge of the patient's history, medications, diagnostic tests, assessment priorities and potential complications. Additionally the theoretical content necessary to care for a pulmonary embolus (PE) and gastrointestinal (GI) bleed patient was covered in two course examinations that the students had previously taken. The lecture exam grade was disclosed and averaged with a post simulation examination. Scenarios were scripted and implemented by faculty. Clinical instructors randomly placed students in groups of three, four, or five students and then randomly assigned roles for the scenario. Students participated in one of the following Medical Education Technologies, Inc. (METI) scenarios PE (n=53) GI bleed (n=51) after receiving a report by the clinical faculty. The students performed the simulation until the patient was transferred to the intensive care unit. Faculty did not intervene during the

simulation exercise. A one hour debriefing session was held at the conclusion of the scenario along with a ten item post simulation examination. The examination variable was constructed using a four point grading scale.

Hierarchical multiple regression techniques were used to evaluate the hypothesis of the study; students who participate in a simulation experience will have a higher score on an examination than students who did not participate in a simulation. The researchers used STATA 11 software for analysis and ANOVA to detect differences in means of study variables. Using Cohen's (1988) statistical power analysis, the minimum acceptable level of power is 0.80. R2 is the addition of a simulation participation manikin variable that is 0.07 and greater. The following results were obtained by the researchers. The students who completed the PE simulation had an average examination score of 6.89 (*SD*=1.40). The GI simulation had an average examination score of 6.08 (*SD*=1.41). The total score possible was ten. With regards to the PE simulation, the study showed a positive relation to the student's score. When the variable was added, the R2 increased the score by eight percentage points. The hypothesis related to the GI bleed was also positively supported. The R2 was added and increased by 9.9 percentage points (Gates et al., 2012).

Gates et al. (2012) concluded that participation in the simulations the study led to the development of a knowledge base that increased the examination performance. The researchers questioned if the preparation before the simulation contributed to the increase in scores and if that same preparation in a traditional clinical setting would also increase student's scores. Further research is needed in this area of HFS.

Clinical Competence

Research supports the use of high-fidelity simulation (HFS) as a teaching strategy in nursing education. Studies are needed to validate the initial expenditures of technology and training by showing the development of clinical competence. Research has primarily focused on psychomotor skills, teamwork and delegation.

Garrett, MacPhee, and Jackson (2010) reviewed the literature to determine that HFS participants attain psychomotor skills faster and demonstrate a higher level of performance than participants in a traditional clinical setting. The researchers used Jeffries (2007) Nursing Education Simulation Framework in an evaluation study of design considerations impacting the outcomes of using HFS with team based scenarios in a nursing education setting. The study took place in the undergraduate program of a Canadian school of nursing. The simulation center included two Laerdal HFS manikins and one pediatric HFS manikin. Eight faculty members were trained to operate the HFS manikins and run scenarios. The convenience sample for the study included 30 volunteer students in their senior year. Focus groups composed of four groups of seven students each were conducted after the simulation exercises to obtain feedback. Students were given reading and web-based interactive material assignments to prepare them for the simulation. These assignments matched the patient information that would be given in the scenario. Students were oriented to the laboratory as well as the videotaping and debriefing procedure. They were not given pre assigned roles. They were expected to work in teams of three or four students and implement communication and team work. At the beginning of the simulation exercise, students were given a report on the patient and were provided access to medical records such as charts, records, and diagnostic and

laboratory tests. Following the simulation, students moved to a separate room for debriefing. The video recording was played back for the participants to view and discuss the overall experience. The total time for the scenario was approximately 60 minutes.

Garrett, MacPhee, and Jackson (2010) noted that evaluations by students identified positive learning experiences. Most feedback was consistent with previous research findings. Students valued an opportunity to view the effects of their care on a patient's condition. All students expressed feeling more confident following the HFS. The least appreciated aspect of the scenario was teamwork. Students stated they would have preferred to work independently or in pairs. Faculty identified roles and responsibilities as a difficult component for the students. Of the 15 groups, only two groups organized themselves and performed well within their roles and responsibilities. Faculty determined these two groups had more favorable patient outcomes than the other groups. The researchers recognized that it can be challenging for educators to determine the best way to meet learning outcomes from HFS. The researchers identified specific considerations for effective learning with HFS. The considerations include (a) resources and support, (b) simulation design framework, (c) faculty training and resource materials, (d)student orientation with clear learning goals, (e) physical layout, (f) student group size, (g) setting the stage, (h) time, (i) emphasis on key concepts, (j) real-life scenarios, (k) symmetrical scenarios, (l) facilitator prompts, (m) videotaping, and (n) debriefing. Results of this study allow for careful consideration of components of HFS that are necessary in order for students to have a positive outcome of clinical competence.

Sportsman, Schumacker, and Hamilton (2011) used Baramee and Blegen (2003) Model as the theoretical framework in a descriptive, longitudinal study to determine if

HFS in a simulation center is a valid alternative to experience in the clinical setting. The research questions focused on the following areas: student's sense of their own clinical competence, anxiety regarding school performance, attitudes and interest in learning, motivation to learn, concentration during learning activity, and satisfaction with the clinical learning environment. The first question asked what impact participation in scenario-based simulation has on student's sense of clinical competence, anxiety, attitude, motivation to learn, concentration during activity and satisfactory with the learning environment. The second research question asked what impact participation in simulation had on a senior's grade point average and scores on the exit exam. The study took place in the western United States as a collaborative study between a liberal arts university, a community college and a 359 bed regional medical center. The sample included 895 junior and senior nursing students across a three year time span. Data were collected in January 2005, 2006 and 2007 from baccalaureate (BSN) juniors and from associate degree nursing (ADN) students who had successfully completed Fundamentals in the fall. Students in the 2007 class had more simulation opportunities than those in the 2005 class. Data were also collected from senior nursing students in April 2005, 2006, and 2007 that were expected to graduate in May. Most of the participants were female (85%) with over half (63%) between the ages of 19 to 29 years of age. Less than half had previous health care experience. Standardized exit exam scores and grade point averages at the time of graduation were collected from each school, the BSN and ADN, for 2006 and 2007. Exit testing scores for 2005 were not available due to a change in the testing mechanism. The researchers used four data collection instruments along with a researcher developed demographic sheet. The instruments included the Clinical Competence

Appraisal Scale (CCAS), a 44 item questionnaire with five subscales utilizing a 6 point Likert scale: psychomotor skills performance (PSP), leadership, teaching/collaboration, planning/evaluation, interpersonal relationships/communication. Four subscales from the Learning and Study Skills Inventory (LASSI): anxiety, attitude, concentration, and motivation were used. The third instrument was the Clinical Learning Environment Scale (CLE). It is a 23 item survey with five subscales: staff-student relationships, nurse manager commitment, patient relationships, interpersonal relationships and student satisfaction. The final instrument was a 100 question standardized exit examination.

The results of the data analysis for each research question were as follows: Research question one: All data were compared from year to year, as participation in simulations increased each year. The CCAIS subscale PSP showed scores dropping over the three year study, from 44.41 to 40.71. Juniors in 2005 who had no simulation experiences rated their competence in skills higher than those who participated in simulation in 2006 and 2007. Senior student participants showed no significant difference for the CCAIS subscale PSP, LASSI or CLE. The only CCAIS subscale with a significant difference (n=308. f=8.723, p=.001) was leadership. For the LASSI, the mean score of the Anxiety subscale was significantly higher, indicating 2005 seniors had lower anxiety than 2006 and 2007 seniors (n=327, f=4.249, p=0.15). Research question two: Mean scores on the standardized test and GPAs were compared over the three year period with no significant differences found with increasing simulation experiences for either program (Sportsman et al., 2011).

Sportsman, et al. (2011) concluded that the simulation experience may be unique due to the collaborative efforts. Additionally, the experience of the faculty increased

over the years which may have created variations in how simulations were administered. It was suggested by the researchers that this study be replicated with a control group that does not participate in HFS. Further research is needed to determine if stress and anxiety are deterrents for full student participation.

Lasater (2007) used Morgan's (1997) principles for focus group facilitation in a qualitative study that examined the experiences of students in a first term nursing program that incorporated HFS into the curriculum. Four dimensions of clinical judgment were explored: student's self-report of confidence in their clinical skills, student's ability for critical thinking, qualitative observations of student's clinical judgment skill during simulation, and student's experience with simulation, conveyed through the focus group. The study took place in the western United States at a school of nursing in Oregon. The sample included 39 junior nursing students who were all invited to join the focus group. Participants were enrolled in the Nursing Care of the Acutely Ill Adult course. Participants had weekly HFS experiences. Eight students comprising participants under the age of 24, females or with no previous degrees, or Caucasian race, were characteristics identified by the researcher for the traditional student focus group. Fifteen nontraditional students were identified as older than 25, or males with a previous degree, or non-Caucasian. The focus groups took place in the simulation laboratory. A 90 minute session was videotaped for analysis. Lasater conducted the focus groups with predetermined questions for prompts and questions for clarification (Lasater, 2007).

The results of the retrospective data analysis were as follows. Thirteen primary themes were initially identified by Lasater and then broken down into five major codes: (a) strengths and limitations of HFS, (b) paradoxical nature of simulation, (c) intense

desire for more direct feedback about their performance, (d) value of student's connection with others, and (e) some general recommendations for better facilitation and learning. The transcripts categorized 95% of the student responses into one of the five codes. The researcher identified the following strengths of HFS. The first strength was the integration of the theoretical content into the clinical setting. This requires students to critically think about what to do. The second strength was the extent of experience gained. Some students had little exposure to varying patient conditions and HFS allowed them to gain more experiences than was available in the clinical setting. The limitations of HFS were the limits of the simulator's voice. The lab staff was all females so the voice of the simulated patient was always female. The simulator also was unable to show nonverbal communications. As there were limitations on how the students could assess physical changes such as pupil size and reflexes. Additionally, the focus group recommended allowing more time for reflection or debriefing (Lasater, 2007).

Lasater (2007) concluded that the simulation experience is best used for students to transfer knowledge from the laboratory to the clinical setting. Nursing programs should use focus groups once a year to make sure the objectives of simulation match student perceptions of the experience. Debriefing allows for sharing of experiences and developing critical thinking skills.

Summary

This chapter has described a literature review of the use of HFS as a teaching strategy to improve critical thinking skills in nursing students in both the clinical and classroom settings. With regards to the use of HFS and the effects of self-confidence or efficacy, the only study that did not support the positive correlation was Pike and

O'Donnell (2010). All other reviewed studies supported the use of HFS in increasing or improving confidence and efficacy. Research in the area of critical thinking and HFS provided information on the importance of faculty being adequately trained and prepared for the scenarios. In a study by Guhde (2011), there was no significant difference in student scores when using a simple vignette versus a HFS. Gates, Parr and Hughes (2012) concluded that HFS increased a student's examination performance. It can be concluded from this review that HFS is a valuable teaching strategy and can help the majority of nursing students prepare for the clinical setting by improving self-confidence, critical thinking and overall competence. Researchers did identify some barriers to student success such as the overall design of the scenario, the faculty's familiarity with the use of simulation, and the individual student's response to the situation which could cause stress and anxiety and could deter participation.

Chapter III

Methodology

Introduction

Newly graduated nurses are expected to perform patient care effectively and efficiently. Faced with increasingly complex care situations, nurses must possess good critical thinking and problem solving skills to be able to provide prudent, safe care. HFS is currently used as an active teaching strategy to expose the student nurse to a variety of patient conditions in a controlled laboratory setting. HFS assists in developing critical thinking skills along with improving self-confidence and competency in the clinical setting.

The purpose of this study is to examine the relationship between HFS and student self-confidence and clinical competence. The researcher will use Tanner's Clinical Judgment Model (Tanner, 2006) as a framework. There are two research questions for this study. How do student ratings of self-confidence and faculty ratings of student competence correlate between midterm and final assessment? How does enrollment in a traditional versus simulation-enhanced laboratory course impact student self-confidence and clinical competence? This study is a replication of Blum, Borglund, and Parcell's (2010) study.

Population, Sample, and Setting

The study population will be associate degree (ADN) nursing students in the second medical surgical course of the ADN program at a Midwestern nursing school in the United States. A convenience sample (*n*=25) of ADN students will be used in this study. Participation in this study will be confidential and voluntary. Each student will be assigned an identification number. Students will be enrolled in one of three laboratory sections. Each section will meet 2 hours every week for ten weeks. The control group (*n*= 8) will demonstrate skill competency using a traditional laboratory skills trainer with no HFS. The experimental group sections (*n*= 17) will demonstrate skills using Laerdal's high-fidelity simulator.

Protection of Human Subjects

Prior to implementation of the study, the research plan will be presented to the college's Institutional Review Board for approval. Participation will be voluntary. The purpose, risks, and benefits will be explained to potential participants. No participation risks have been identified. The benefit of participation in this study will be providing nurse educators with a better understanding of how to foster the development of self-confidence and clinical competence in nursing students through the use of critical thinking activities. Written consent for participation will be obtained. Each student will be assigned an identification number for use with the Lasater (2007) Clinical Judgment Rubric.

Procedures

The students in both the experimental group and the control group will be exposed to a different patient condition every week for ten weeks during the semester.

The students in the control group will use a traditional laboratory with low-fidelity or simple task trainer mannequins. The experimental groups will use a HFS scenario. At midterm and finals week, student and faculty participants will complete a questionnaire of items from the Lasater (2007) Clinical Judgment Rubric (LCJR).

Instrumentation

Selected items from the Lasater Clinical Judgment Rubric (LCJR) (2007) will be used for this study. The LCJR will be completed in the presence of the researchers. The rubric has four subscales, noticing, interpreting, reflecting and responding. The four subscales are based on Tanner's (2006) Model. There are a total of 11 items within these four subscales and eight items will be chosen by the researchers. To evaluate self-confidence, the following items will be reviewed: (a) calm/confident manner, (b) well-planned interventions/flexibility, (c) evaluation/self-analysis, and (d) commitment to improvement. Clinical competence will be evaluated using the following subscales: (a) recognizing deviations from expected patterns, (b) information seeking, (c) prioritizing data, and (d) clear communication. Each item is rated using a Likert-type scale of one to four, with one being beginning and four being exemplary. Psychometrics supports the use of this rubric in HFS research. The LCJR inter-rater reliability is (alpha of .87), and internal consistency of the subscales is (Cronbach's alphas range from .886 to .931) (Blum, et al., 2010).

Design

The study will use a quasi-experimental, quantitative design. This type of design is appropriate to determine the relationship between the use of HFS and the effect it has on a nursing students' self-confidence and clinical competency.

Data Analysis

The ratings from the selected items from the LCJR will be used to determine student and faculty members perceived level of clinical judgment development. Self-confidence will be measured using four items: calm/confident manner, well-planned interventions/flexibility, evaluation/self-analysis, and commitment to improvement. Clinical competence will be measured using four items: recognizing deviations from expected patterns, information seeking, prioritizing data, and clear communication (Blum, et al., 2010). Data will be analyzed using the Statistical Package for Social Sciences (SSPS), version 17.0. Cross tabulations, Pearson's correlations, Cronbach's alpha, and paired samples *t*-tests will be used to determine associations between the midterm and final ratings of items from the LCJR (Blum, et al., 2010). The ratings from the control group and the experimental group will be evaluated and compared to determine the effect HFS has on self-confidence and competency.

Summary

This chapter has described the methods and procedures that will be conducted for the research study. The study is a quasi-experimental design to determine if HFS improves self-confidence and competence in nursing students from an ADN program in the Midwest United States. Participants will complete the LCJR with selected items during midterm and finals week. The data will be analyzed using the SSPS computer program to determine if there is any significant difference between the scores of the control group and experimental group during midterms and finals week. This study will replicate a previously conducted study by Blum et al. (2010) with the anticipation of validating previous research results along with endowing additional information on the

significance of using HFS to improve self-confidence and competency in the clinical setting.

References

Bambini, D., Washburn, J., & Perkins, R. (2009). Outcomes of clinical simulation for novice nursing students: Communication, confidence, clinical judgment. *Nursing Education Perspectives, 30*(2), 79-82.

Bandura, A. (1986). *Social Foundations of thoughts and action*: *A Social Cognitive Theory*. Englewood Cliffs. New Jersey: Prentice Hall.

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behaviors, 31*(2), 143-164.

Baramee, J., & Blegen, M. (2003). New graduate perception of clinical competence: Testing a causal model. *International Journal of Nursing Studies, 40*(4), 389-399.

Blum, C. A., Borglund, S., & Parcells, D. (2010). High-fidelity nursing simulation: Impact on student self-confidence and clinical competence. *International Journal of Nursing Education Scholarship, 7(*1), 1-14.

Bradley, P. (2006). The history of simulation in medical education and possible future directions. *Medical Education, 40*(3), 254-262.

Cervero, R. (1985). Continuing education and behavior change: A model for research evaluation. *Journal of Continuing Education in Nursing, 16*, 85-86.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Hillsdale, NJ: Lawrence Erlbaum.

Dillard, N., Sideras, S., Ryan, M., Carlton, K., Lasater, K., & Siktberg, L. (2009). A collaborative project to apply and evaluate the Clinical Judgment Model through simulation. *Nursing Education Perspectives, 30*(2), 99-104.

Facione, N. & Facione, P. (2006). *Health Sciences Reasoning Test (HSRT): A test for critical thinking skills for health care professionals. Test Manual*. Millbrae, CA: The California Academic Press LLC.

Garrett, B., MacPhee, M., & Jackson, C. (2010). High-fidelity patient simulation: Considerations for effective learning. *Nursing Education Perspectives 31*(5), 309-313.

Gates, M., Parr, M., & Hughen, J. (2012). Enhancing nursing knowledge using high-fidelity simulation. *Journal of Nursing Education, 51*(1), 9-15.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* New York, NY: Sociology Press.

Guhde, J. (2011). Nursing students' perceptions of the effects on critical thinking, assessment and learner satisfaction in simple versus complex high-fidelity simulation scenarios. *Journal of Nursing Education, 50*(2), 73-78.

Jeffries, P., & Rizzola, M. (2006). Designing and implementing models for the innovative use of simulation in teaching nursing care of ill adults and children: A national, multi-site, multi-method study. New York, NY: National League for Nursing. retrieved from www.nln.org/research/LaerdalReport.pdf.

Jeffries, P. (2007). *Simulation in nursing education: From conceptualization to evaluation.* New York, NY: National League for Nursing.

Jeffries, P. (2005). A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives, 26*(2), 96-103.

Kameg, K., Clochesy, J., Mitchell, A., & Suresky, J. (2010). The impact of high- fidelity simulation on self-efficacy of communication skills. *Issues in Mental Health Nursing*, *31*(5), 315-323.

Lasater, K. (2007). High fidelity simulation and the development of clinical judgment: Students' experiences. *Journal of Nursing Education*, *46*(6), 269-276.

Lenburg, C. (1999). The framework, concepts, and methods of the Competency Outcomes and Performance Assessment (COPA) Model. *Online Journal of Issues in Nursing*, 4(2). Retrieved from EBSCO *host*.

Lewis, D., & Ciak, A. (2011). The impact of a simulation lab experience for nursing students. *Nursing Education Perspectives*, *32*(4), 256-258.

McNeal, G. (2010). Simulation and nursing education. *The ABNF Journal*, *21*(4), 78.

Merriam-Webster Online (2012). Self-Confidence. Retrieved from http:// www.merriam-webster.com/dictionary/self-confidence.

Morgan, D. (1997). *Focus groups as qualitative research* (2nd ed.). Newbury Park, CA: Sage.

Pike, T. (2008). *Confidence and competence in nursing education*. (Unpublished Master of Science Dissertation). University of Glasgow.

Pike, T., & O'Donnell, V. (2010). The impact of clinical simulation on learner self-efficacy in pre-registration nursing education. *Nurse Education Today*, *30*(5), 405-410.

Roy, C., & Andrews, H. (1999). *The Roy Adaptation Model*. (2nd ed.). Stamford, CT: Appleton & Lange.

Smith, S., & Roehrs, C. (2009). High fidelity simulation: Factors correlated with nursing student satisfaction and self-confidence. *Nursing Education Perspectives, 30*(2), 74-78.

Sportsman, S., Schumacker, R., & Hamilton, P. (2011). Evaluation the impact of scenario based high-fidelity patient simulation on academic metric of student success. *Nursing Education Perspectives, 32*(4), 259-265.

Sullivan-Mann, J., Perron, C., & Fellner, A. (2009). The effects of simulation on nursing students' critical thinking scores: A quantitative study. *Newborn & Infant Nursing Reviews, 9*(2), 111-116.

Tanner, C. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45*(6), 204-211.

White, K. (2009). Self-confidence: A concept analysis. *Nursing Forum, 44*(2), 103-114.

Wotton, K., Davis, J., Button, D., & Kelton, M. (2010). Third-year undergraduate Nursing student's perceptions of high-fidelity simulation. *Journal of Nursing Education, 49*(11), 632-639.